

## EXECUTIVE SUMMARY

The Aquifer Pumping Test/DNAPL Recovery Optimization is a work effort specified in the Commissioning, Startup, and Initial Operation of the Source Recovery System (SRS) project. It requires the preparation of an aquifer pump test plan, the execution of the test, and the preparation and submittal of a technical memorandum (test report) presenting the test results. The Aquifer Pumping Test Report/DNAPL Recovery Optimization is presented here. Recommendations are made for recovery of free-phase DNAPL from OU 2 by pumping from well U2-31. These recommendations are based on pumping tests conducted in the field, laboratory core flooding experiments, and theoretical predictions of simple analytical models.

DNAPL pumping tests have demonstrated that well U2-31 is the only recovery well at OU 2 which will produce DNAPL. Four pumping tests which have been conducted at well U2-31 indicate similar drawdown and recovery trends, even though the modes of operation were quite different. Maximum achievable DNAPL recovery rates, averaged over 24-hour periods, have consistently been less than 1.0 gpm and have decreased over time as the level of the top of the DNAPL pool has correspondingly dropped.

Core flooding experiments were conducted with undisturbed sand cores collected from the DNAPL saturated portion of the aquifer near U2-31. The data indicate that the mobility of the DNAPL through the sand is substantially greater than the mobility of the ground water displacing the DNAPL. Thus, operating the recovery well at high pumping rates should not induce viscous fingering of the water through the DNAPL in the aquifer. This means that the pumping rate from the well can be optimized on the basis of above-ground fluid handling considerations without concern for isolation of DNAPL stringers in the aquifer.

A simple analytical model has been developed to predict DNAPL recovery rates over time. This model predicts that a total of 30,000 to 40,000 gallons of mobile DNAPL are recoverable from U2-31 and approximately 100 days of continuous pumping would be required to recover the majority of it. However, due to heterogeneities of the aquifer which are not accounted for in this model, these predictions should only be used as qualitative estimates.

Based on the results of this test, recommendations for DNAPL recovery from well U2-31 are made. Continuous operation of the well pump for several days at a flow rate of approximately 0.5 gpm is advised. Adaptations in operating conditions should continue to be made on the basis of additional operating experience.